DETERMINATION OF AROMA COMPOUNDS IN VRANEC WINES PRODUCED WITH DIFFERENT OENOLOGICAL PRACTICES

Elena Bogeva[1,2] Violeta Ivanova-Petropulos[1], Trajče Stafilov[3], Marina Stefova[3], Barbara Siegmund[4], Nicole Pabi[4], Ernst Lankmayr[4]

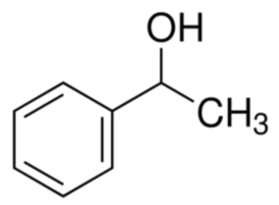
[1]Faculty of Agriculture, University "Goce Delčev", Štip, Krste Misirkov bb, 2000, Štip, Republic of Macedonia
[2]Institute of Chemistry, Faculty of Natural Sciences and Mathematics, Ss. "Cyril and Methodius" University, Arhimedova 5, 1000 Skopje, Republic of Macedonia
[3] Royal Winery Queen Maria, 1422 Demira Kapija, Republic of Macedonia
[4]Institute of Analytical Chemistry and Food Chemistry, Graz University of Technology, NAWI Graz, Stremayrgasse 9/II, A8010 Graz, Austria
e-mail: elena_bogeva@yahoo.com

INTRODUCTION

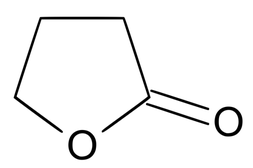
Wine aroma is a one of its most important characteristics produced by a complex balance of different chemical classes of volatile compounds, belonging to higher alcohols, esters, aldehydes, lactones, terpenes, C_{13}-norisoprenoids, volatile phenols, fatty acids, carbonyls, sulphur and nitrogen compounds. During maceration, wine aroma increases due to the extraction of aromatic components from the grape skins. Addition of enzyme and oak chips also influence the wine aroma composition.

The aim of this work was: (1) to identify of the volatile compounds in Vranec wines and (2) to study different oenological practices, such as maceration time and addition of enzyme and oak chips in the grape mash during fermentation, on the content of aroma compounds in the wines, applying HS-SPME-GC-MS technique.

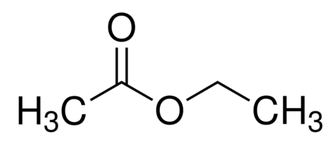
Chemical structure of some volatile compounds



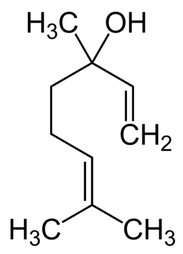
Phenylethyl alcohol



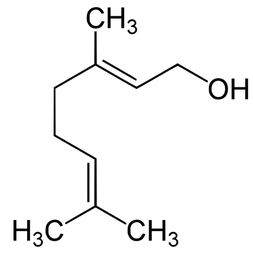
Butyrolactone



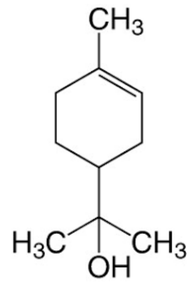
Ethyl Acetate



Linalool



Geraniol



Terpineol

MATERIALS AND METHODS

Wine samples: Vranec (*Vitis vinifera* L.) wines produced with maceration of 4, 7, 14 and 30 days in presence of enzyme (E) and oak chips (OC).

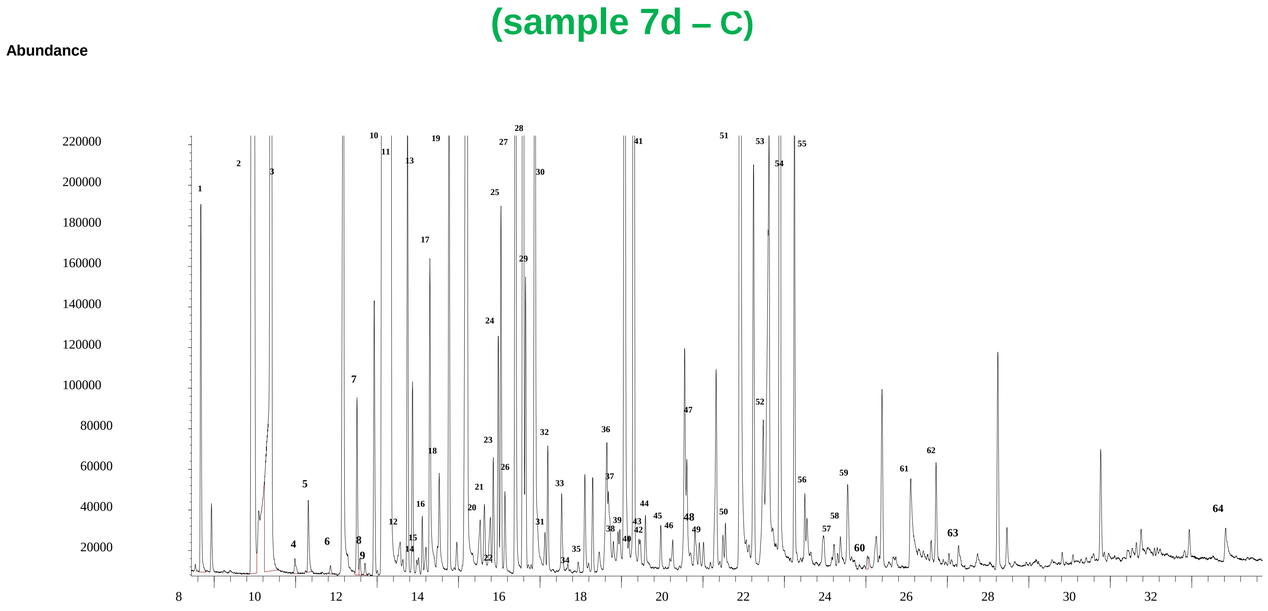
HS-SPME-GC-MS

✓GC-MS analysis: Agilent system (GC 7890, MS 5975c VL MSD)
✓Column: HP5MS, 30m*0.25mm*1µm, Agilent Technologies
✓Temperature program: -10 °C for 1 min with a temperature ramp of 8 °C min^{-1} up to 270 °C (holding time 1 min).

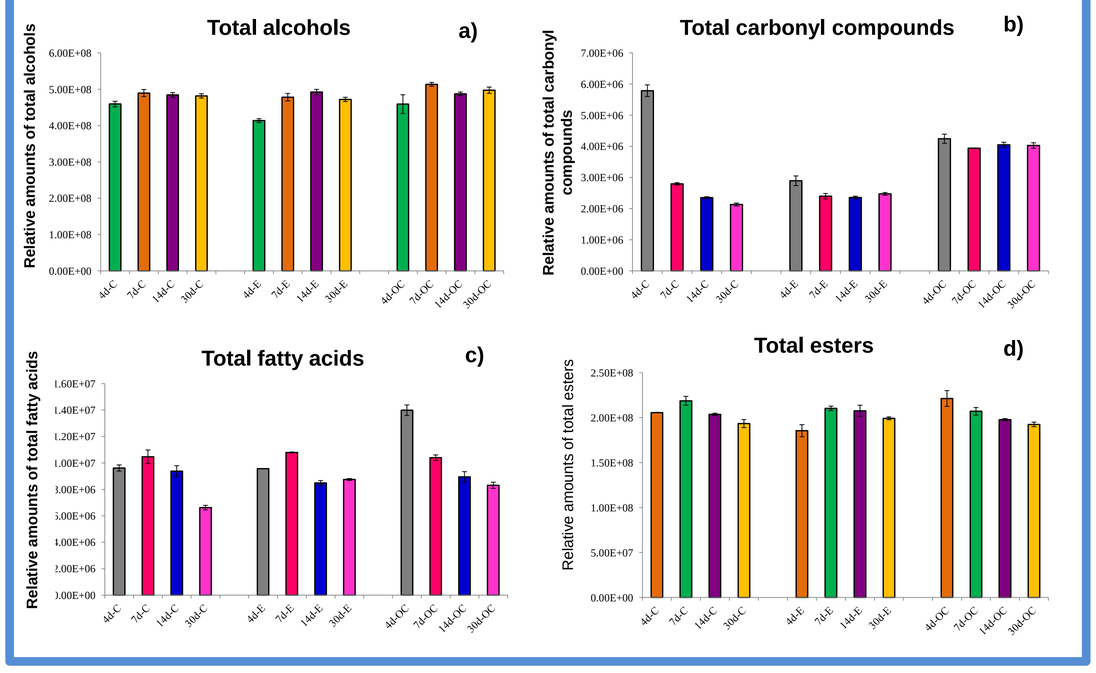
HS-SPME-GC-MS instrumentation

RESULTS AND DISCUSSION

Total ion chromatogram of the 63 aroma compounds found in Vranec wine (sample 7d – C)



Relative amount of total alcohls (a), total carbonyl compounds (b), total fatty acids (c) and total esters (d) in Vranec wines



CONCLUSION

- ✓ A total of 63 individual aroma compounds have been detected in Vranec wine samples prepared under controlled vinification conditions.
- ✓ Vranec wines presented complex aroma profile rich in different families of aroma compounds: esters, alcohols, fatty acids, aldehydes and ketones.
- ✓ Maceration time affects the content of aroma compounds leading to increased relative amounts of volatile compounds from the fourth to seventh day of maceration.
- ✓ The presence of oak chips enhanced the formation of phenylethyl alcohol, isobutyl alcohol, propanoic acid ethyl ester, butanoic acid ethyl ester, pentanoic acid ethyl ester and hexanoic acid ethyl ester.
- ✓ No significant effect of the enzyme to the volalatile compounds in wine was observed.

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